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## NEW SPECIES AND RECORDS OF NEARCTIC HYDROPTILIDAE (TRICHOPTERA)

By D. G. DENNING, University of Wyoming, Laramie, Wyo.

A recent study of Hydroptilidae disclosed not only several new species but a number of interesting and unsuspected distributional records. The seven new species described herein will increase the number of Hydroptilidae known from the United States and Canada to 127 species. Unless indicated otherwise all types are in the authors collection at the University of Wyoming. I would like to take this opportunity to thank Mr. M. W. Wing, Mr. W. W. Wirth and Mr. R. E. Pfadt for collecting some of the specimens discussed in this paper.

### *Leucotrichia pictipes* (Banks)

This is the first time this species has been recorded from California. In all specimens collected the claspers were directed rather sharply ventrad instead of caudad and slightly ventrad as is usual. Other differences between these and specimens collected elsewhere in its wide range are of minor importance. However, an extreme condition in which the claspers (viewed ventrally) are not fused their entire length is illustrated, fig. 1.

California: Kaweah River, Tulare County, July 2, 1947, 14 males (W. W. Wirth).

### *Tascobia brustia* (Ross)

Not recorded since the holotype was collected at Parco, Wyoming. The specimen was taken from the swift flowing North Platte River at an approximate elevation of 7500 feet. Wyoming: 8 miles north of State Line, North Platte River, September 7, 1947, 1 male (D. G. Denning).

### *Tascobia delira* (Ross)

Previously recorded from Wisconsin, this species apparently

has a wide distribution as shown by the following records, Wyoming: Laramie River, Laramie, Wyoming, July 28, 1947, 1 male (D. G. Denning). Colorado: Permanent Pond, Rocky Mt. National Park, August 10, 1947, 1 male, 1 female, (D. G. Denning); Stream South of Walden, August 10, 1947, 1 male (D. G. Denning); Poudre River, 15 miles west of Ted's Place, August 17, 1947, 8 males, 2 females (D. G. Denning); Poudre River, 15 miles east of Cameron Pass, August 17, 1947, 9 males, 6 females (D. G. Denning); Junction Elkhorn Creek and Poudre River, east of Cameron Pass, August 19, 1947, 2 males, 5 females (D. G. Denning).

*Mayatrichia ayama* Mosely

This species has not been recorded from Canada, which constitutes a considerable extension in its known northerly range.

Saskatchewan: Saskatoon, August 1, 1947, Light trap, 21 males, 40 females (R. Coleman).

Wyoming: near Wheatland, Bluegrass River, at lights, 1 male, 4 females (D. G. Denning). The Wyoming male indicates that minor variations in the apex of the aedeagus and ventro-lateral processes will be encountered.

*Ochrotrichia stylata* (Ross)

This species is one of the most abundant Hydroptilidae in Wyoming. The species has been collected from June 19 to October 1, and although the weather conditions were favorable none could be taken later than that date. The species was taken only from clear, fast flowing streams. It is here recorded from Colorado, Utah and South Dakota for the first time. Several hundred males and females from southern Wyoming, June 19 to October 1, 1947. South Dakota: Legion Lake, near Custer, August 28, 1947 (D. G. Denning). Colorado: Boulder River, near Boulder, September 28, 1947 (D. G. Denning). Utah: Duchesne, Strawberry River, September 26, 1947, 3 males, 4 females (R. E. Pfadt).

*Ochrotrichia potomus*, n. sp.

This species is closely related to *tarsalis* (Hagen) but can be distinguished from it by the dorsal aspect of the tenth tergite. Color and general structure typical of genus. Antennae long reaching almost to apex of tenth tergite, consisting of 27 to 28 segments.

*Male*: Length 2.7 mm. Genitalia as in fig. 2. Mesal incision of ninth tergite wide, deep, extending almost to base;

segment almost quadrate from lateral aspect, except that dorso-caudal corner is produced caudad. Apical part of tenth tergite from dorsal aspect, fig. 2, divided into a group of sclerotized processes. Ventral plate concave, bounded on left by "A"; slender apically widened aedeagus rests on this plate. The right part, "B," terminates at base of "F." Process "C" short and acute, extends caudad to base of "D." The prominent very heavily sclerotized process "D," acute distally, gradually curved mesad (degree varies in individuals, in some almost at right angle); seen from lateral aspect apex curved slightly dorsad above any other portion of tergite. Hidden from dorsal view by base of "D" is a small acute process "G" which extends laterad to edge of structure. Long stout right process "F," has distal portion twisted, apex attenuated and bent sharply laterad and slightly cephalad; seen from lateral aspect apex turned dorsad. Claspers symmetrical, mesal surface concave, apex bluntly pointed, entire structure directed gradually dorso-caudad to a point just dorsad of tenth tergite; inner margin of apex and ventral distal third clothed with dense, short black setae. Left clasper with a single short black-tipped spine on mesal surface just beyond base, seen laterally directed dorsad; dorso-mesal margin with a single short spine base. Mesal margin of right clasper, just beyond base, with one short cephalad directed spine.

*Female*: General structure, size and color similar to male. Genitalia as in fig. 2A. Eighth sternite heavily setose, mesal lobe wide, rounded, distinct emargination near lateral margin. Shape and position of bursa copulatrix as in figure.

Holotype, male.—Torrington, Wyoming, North Platte River, October 1, 1947 (D. G. Denning).

Allotype, female.—Same data as for holotype.

Paratypes.—Torrington, Wyoming, North Platte River, September 19, 1947, 2 males, 1 female (D. G. Denning); Torrington, Wyoming, North Platte River, September 19, 1947, 1 male (R. E. Pfadt); Torrington, Wyoming, North Platte River, August 27, 1947, 1 male (D. G. Denning).

### *Ochrotrichia oregona* (Ross)

This species has not been recorded since its original description from La Grande, Oregon. Apparently *oregona* is quite a plastic species, in the relatively small series of males examined by the

writer (13) considerable variation was exhibited in the contour of the clasper, in the density and arrangement of the cluster of black spines along the ventro-mesal margin of each clasper and in the two basal sclerotized points of the tenth tergite. In this latter respect eight of thirteen males were very similar to that illustrated by Ross (1938) while five varied from a condition in which the larger most caudad spine was directed slightly cephalad to an extreme where it was curved sharply cephalad and slightly laterad and lying just above the main structure, in the same specimen the most basal spine is curved sharply mesad and cephalad.

*Female*: Length 3.1 mm. Genitalia as in fig. 3. Mesal process of seventh sternite slender, acute. Apical margin of eighth sternite nearly straight, merges almost imperceptibly into ninth. The shield-shaped area of the eighth sternite has a reticulate surface composed of oblong almost linear reticules, apical margin acute, lateral margin arcuate, basal margin withdrawn into seventh segment. Present near the basal portion of the eighth sternite is a prominent heavily setose, acute mesal projection, surface bearing short tubercle-like structures, several long prominent setae along margin. Bursa copulatrix long, reaching cephalad into seventh segment, apical branches incised.

Allotype, female.—Granby, Colorado, Colorado River; September 27, 1947 (R. E. Pfadt).

Colorado: 10 males, 8 females, same data as for allotype.

Wyoming: 8 males north of State Line, North Platte River, September 8, 1947, 3 males, 1 female (D. G. Denning).

#### *Oxyethira cibola* Denning

This recently described species was previously known only from Macon, Georgia. The species is evidently present either in rivers or lakes.

Wyoming: Douglas, at light, July 29, 1947, 1 male (D. G. Denning); Cheyenne, along small lake in park, August 2, 1947, 2 males (D. G. Denning); Cheyenne, along small lake in park, August 7, 1947, 22 males (D. G. Denning).

#### *Oxyethira serrata* Ross

This species was previously recorded from Illinois, New York, Wisconsin, Minnesota and British Columbia. The species is probably transcontinental in distribution.

Wyoming: Cheyenne, along small lake in park, August 2, 1947, 7 males (D. G. Denning); Cheyenne, along small lake in park, August 7, 1947, 93 males, 7 females (D. G. Denning).

*Hydroptila argosa* Ross

This species has been found widely distributed throughout the eastern half of Wyoming and has been collected from June 19 to September 20.

*Hydroptila callia*, n. sp.

This species bears some resemblance to *Hydroptila amoena* Ross but differs radically from it in the three filamentous processes of the aedeagus, the long slender ventrad directed clasper, the prominent process at the base of the clasper and several other details of the genitalia.

*Male*: Length 3.5 mm. Genitalia as in fig. 4. Mesal projection of the seventh sternite, fig. 4C, long, reaching to the ninth sternite, slender, about same width throughout, ventro-apical margin serrate. Ventral margin of ninth segment bordered with dense prominent setae, lateral lobe projected ventro-caudad, bearing several large prominent setae. Invaginated lateral part of ninth segment long, reaching into seventh segment. Tenth tergite from dorsal view, fig. 4B, deeply cleft along meson, has appearance of being divided almost entire length; viewed laterally apex nearly truncate, a small blunt point at dorsal corner. Base of clasper withdrawn into ninth segment, exposed part directed ventro-caudad, slender throughout, extreme apex with an acute tooth, fig. 4A; claspers closely appressed on meson. Arising from near base of clasper is a prominent dorsad directed process bearing a long caudad directed spine; from ventral aspect these processes are arcuate apex directed slightly mesad, apical spine extending caudad beyond claspers. Seen from ventral view there is a pair of small, not easily discernible, caudad directed tubular processes bearing a caudad directed spine. Aedeagus, when viewed laterally has main part arcuate; viewed ventrally, fig. 4, apical portion divided into three filamentous processes, the largest one gradually tapering to an acute apex and gently curved laterad, the next process slender, about the same width throughout and reaching almost to apex of first mentioned branch, the third process is shortest with a slender acute apex.

Holotype, male.—Raleigh, North Carolina; June 9, 1947, at light (Merle W. Wing).

**Hydroptila wyomia**, n. sp.

This species bears some resemblance to *Hydroptila modica* Mosely, but differs from it and other described species in the beak-like apex of the aedeagus, and several other details of the genitalia.

*Male*: Length 3.5 mm. Sternite of fifth segment bears a pair of protuberances laterally which give rise to a long and a short seta. Mesal style of seventh sternite long, slender, extends caudad beyond margin of eighth sternite for about one-half its distance, apex slightly enlarged, ventral margin somewhat irregular, a few long setae at base.

Genitalia as in fig. 5. Lateral lobe of ninth segment slender, apex curved caudad, dense cluster of caudad directed setae near base, dorsal portion with a cluster of four long stout setae one of which extends beyond the tenth tergite. Near base of lateral lobe arises a prominent tubular process which bears a long seta at ventral corner of apex, fig. 5A; viewed ventrally processes slightly arcuate, apical setae markedly so. Tenth tergite lightly sclerotized, apex blunt from lateral view, emarginate from dorsal view. Claspers short, fig. 5A, somewhat saber-shaped, curved ventrad; viewed from ventral aspect apices darkly pigmented, contiguous along meson, a few minute setae discernible, viewed ventrally a pair of small tubercles, each bearing a long seta, present just cephalad to base of claspers. Aedeagus, fig. 5, long, nearly straight, tubular, basal portion about same length as apical portion, actual length slightly over 1 mm; near base of apical portion arises a slender acuminate filament, distal portion bulbous then abruptly narrowed to a beak-shaped apex; near constriction inner tubular part extends outward to a point beyond apex; beak-shaped apex either blunt or acute, depending on angle of view.

*Female*: Size, color, general characteristics same as for male. Tergite of eighth segment emarginate. Eighth sternite with a single row of 5 to 6 stout, wavy setae. Sixth sternite with a minute acute mesal projection.

Holotype, male.—Laramie River, Laramie, Wyoming, July 1, 1947 (D. G. Denning).

Allotype, female.—Same data as for holotype.

Paratypes.—Same data as for holotype, 3 males, 2 females.

**Hydroptila pullatus**, n. sp.

This species is closely related to *angusta* Ross differing from it in the very slender claspers which are constricted near the center,

the acute ventral plate, the rounded mesal lobe of the tenth tergite and details of the aedeagus. The female of this species differs from *angusta* in the short wide mesal lobe of the eighth sternite, the wider, flattened bursa copulatrix as well as other details.

*Male*: Length 2.3 mm. Seventh sternite with mesal process acuminate, short, about one-half its length extending beyond margin. Genitalia as in fig. 6. Claspers from ventral aspect very slender, narrowed near middle, apices acute, divergent, a dark pigmented spot near base of curve; seen from lateral aspect clasper is directed slightly ventrad, apex curved dorsad. Ventral plate, fig. 6, translucent, membranous, acute apically, bearing three short erect spines just below center. Tenth tergite, fig. 6A, cleft about one-third its length, lateral lobes acute, mesal lobe short and bluntly rounded; lateral margin sinuate, somewhat more heavily sclerotized than remainder. Aedeagus from dorsal view, fig. 6B, slender, long, originating in fifth segment; basal tube gradually narrowed to a creased area which extends almost to spiral process, this portion slender and sinuate; distal portion with bulbous base, gradually narrowed to an acute apex projected laterad almost at right angles; seen from lateral aspect apex acuminate and sharply turned ventrad; spiral process encircles tube one and one-half times, long, apically very slender.

*Female*: Length 3.1 mm. Mesal style of seventh sternite acute, short, does not reach to margin. Eighth sternite, fig. 6C, with a subtriangular reticulate area about center; apical margin with a wide blunt mesal lobe. Eighth tergite, fig. 6D, with a deep blunt incision (not truncate as in *angusta*), lateral lobes rounded. Bursa copulatrix as in fig. 6E, main body compressed, heavily sclerotized, triangular reticulate area on basal margin extends cephalad to cover entire next portion, this and remainder translucent.

Holotype, male.—Bluegrass River, near Wheatland, Wyoming, August 29, 1947 (D. G. Denning).

Allotype, female.—Same data as for holotype.

Paratype, female.—Same data as for holotype.

### *Hydroptila pecos* Ross

This species has not been recorded since its original description from Carlsbad, New Mexico. The following records constitute a considerable extension to the northward of its known range.

*Female*: Length 2.8–3 mm. Genitalia as in fig. 7. Eighth

sternite meson produced into a rounded lobe. A truncate darkened area cephalad to mesal lobe bears several irregularly placed prominent setae along margin. Eighth tergite with a prominent, rounded, heavily sclerotized mesal lobe. Bursa copulatrix as in fig. 7, long, extending to seventh segment, apical margin deeply incised.

Allotype, female.—Torrington, Wyoming, North Platte River, August 27, 1947 (R. E. Pfadt).

Wyoming: Same data as allotype, 7 males, 3 females; Torrington, North Platte River, August 27, 1947, 16 males, 7 females (D. G. Denning); Bluegrass River, near Wheatland, at lights, August 29, 1947, 1 female (D. G. Denning). Colorado: Boulder River, near Boulder, September 28, 1947, 2 males (D. G. Denning).

### *Hydroptila xera* Ross

This species has not been recorded since its original description in 1938 from two localities in Idaho. Apparently it can be found either in lakes or rivers.

*Female*: Length 2.3–3.5 mm. Genitalia as in fig. 8. Tergite of eighth segment with a shallow mesal incision. Sternite of eighth segment with truncate mesal lobe extending slightly beyond the ventro-lateral lobes. A single row of prominent, wavy setae near apical margin. Lateral margin sinuous. Bursa copulatrix large, as in fig. 8.

Allotype, female.—Sodergren Lake, near Woods Landing, Wyoming, August 10, 1947 (D. G. Denning).

Wyoming: Same data as allotype, 10 males, 2 females; Laramie River, Laramie, July 1, 1947, 4 males, 1 female (D. G. Denning); Cheyenne, along lake in park, August 2, 1947, 1 male (D. G. Denning); Cheyenne, along lake in park, August 7, 1947, 2 males (D. G. Denning); Bluegrass River, near Wheatland, at lights, August 29, 1947, 1 male, 4 females (D. G. Denning).

### *Neotrichia ersitis*, n. sp.

This interesting species is not only one of the smallest of the known members of the genus, but it also occurs further north than any other recorded *Neotrichia* in North America.

The species belongs to the *okopa* Ross section of the genus. It can easily be separated from other described species of the genus by the serrate ventrad directed claspers and the three sclerotized hooks of the aedeagus.

*Male*: Length 1.9 mm. Genitalia as in fig. 9. Dorsum of ninth segment with a scattering of dense short setae, apica



margin apparently produced caudad to help form the very irregular appearing tenth tergite, division between the two not discernible. Claspers, seen from lateral aspect, fig. 9A, directed ventro-caudad, thick at base and tapering to a rather acute apex, dorsal margin serrate and bearing a few minute setae. Dorsad to the claspers is a prominent beak-shaped structure directed ventro-caudad and bearing a large seta at apex. Cercus, short, base narrow, tapering gradually to an expanded apex, entire structure heavily setose. Tenth tergite membranous, distal margin irregular in outline, extends caudad slightly beyond claspers. Ventral aspect, fig. 9, shows claspers with mesal margin serrate, apex sub-acute, lateral margin sinuate; cercus finger-like in shape, divergent. Aedeagus, seen from dorsal view, fig. 9B, with base very wide, tubular; suddenly narrowed to a bulbous base bearing a slender filament which encircles structure once and follows aedeagus to near head of apex; apical portion consists of two heavily sclerotized hooks side by side and a shorter, slender, arrow-shaped hook to which the main internal duct is connected.

*Female*: Length 2.3 mm. Apical portion of seventh sternite with a pair of dark colored androconial scale-like structures. Apical margin of eighth segment irregular, bearing six long setae. Main structure of bursa copulatrix as in fig. 9C.

Holotype, male.—Saskatoon, Saskatchewan, August 1, 1947, light trap (R. Coleman).

Allotype, female.—Same data as for holotype.

Paratype, female.—Same data as for holotype.

### ***Neotrichia halia*, n. sp.**

This species is similar to *kitae* Ross but can easily be differentiated from it and other described species by the shape of the subgenital plate, the acute claspers with an apical spine, the terminal processes of the aedeagus and several other details of the genitalia.

*Male*: Length 2 mm. Sternite of eighth segment fringed with long setae. Ninth segment with sternite projected caudad a short distance. Genitalia as in fig. 10. From lateral aspect claspers directed caudad with apex only slightly upturned; from ventral view, fig. 10, claspers short, mesal margin suddenly narrowed about midway to form an acute apex bearing a prominent seta. Cercus from lateral view broad, gradually narrowed apically, fig. 10A; from ventral view it is elongate, divergent, reaching beyond subgenital plate, quite heavily

setose. Subgenital plate viewed from ventral aspect with distal margin arcuate, bearing a pair of prominent divergent spines; viewed from lateral aspect lateral margin flared dorsad, a large horn-like process arises from near distal margin, directed ventrad. Tenth tergite lightly sclerotized, widely emarginate; viewed laterally apex broadly rounded. Aedeagus, fig. 10B, with broad tubular portion over twice as long as apical portion, just beyond narrowed neck is a prominent spiral process encircling tube one and one-half times, directed laterad apically; apex consists of a pair of heavily sclerotized processes, one acuminate, the other hook-like; extending to base of these processes a large heavily sclerotized internal tube is discernible.

*Female*: Length 2.2 mm. Apical part of seventh segment lightly sclerotized and with a dense covering of minute spicules. Eighth segment with apical portion darker than remainder which is translucent. Eighth sternite, fig. 10C, with several long setae along margin; central ornamentation not plainly marked, apex acute; on meson near base of sternite are two very dark androconia scale-like structures, their basal part covered by margin of seventh sternite. Bursa copulatrix, fig. 10D, long, extending from margin of seventh to apical margin of eighth segment.

Holotype, male.—Bluegrass River, near Wheatland, Wyoming, August 29, 1947, at lights (D. G. Denning).

Allotype, female.—Same data as for holotype.

Paratypes.—Same data as for holotype, 2 males.

### ***Neotrichia panneus*, n. sp.**

This species is closely related to *osmena* Ross but differs from it in the slightly upturned apex of the clasper, the ventrad directed apex of the heavily sclerotized structure dorsad to the clasper, the large evenly rounded ventral margin of the cercus, the deeply incised apex of the aedeagus as well as several other details of the male genitalia.

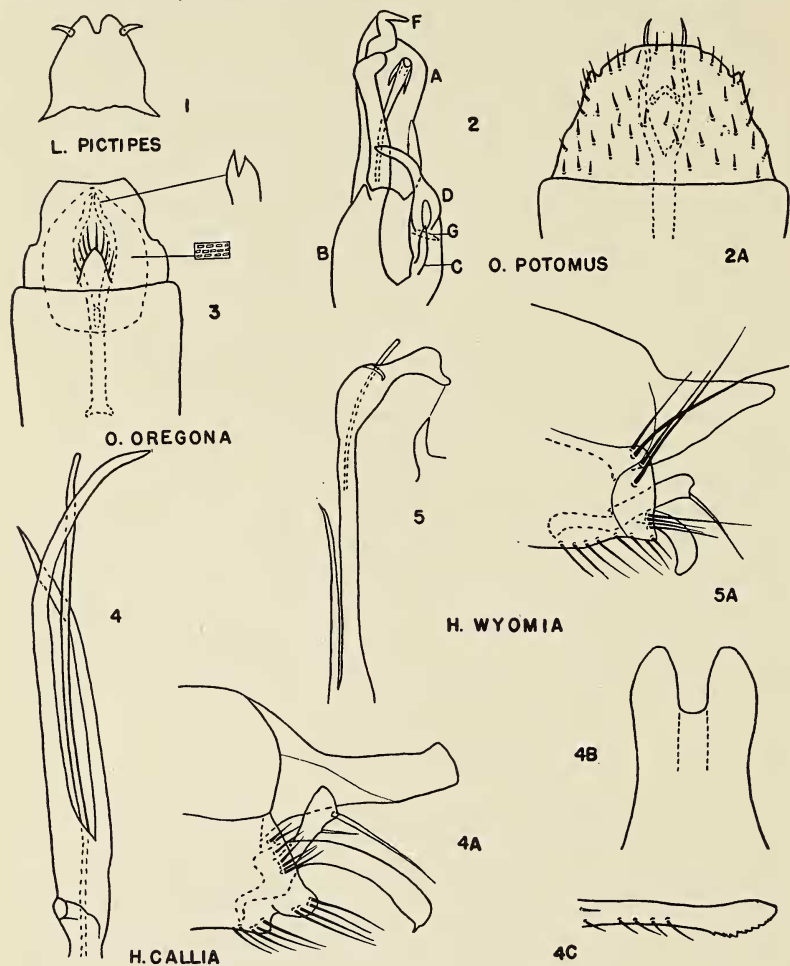
*Male*: Length 2.5 mm. Color of body and appendages light brown. Genitalia as in fig. 11. Dorsum of ninth segment covered with minute rather dense setae, apical margin produced beyond the tenth tergite as an irregular membranous hood, incised mesally; lateral margin difficult to discern clearly; sternite produced caudad as a triangular process. Tenth tergite, fig. 11B, bluntly rounded, margin irregular, a pair of long prominent spines arise from apical margin. Viewed from

lateral aspect base of claspers withdrawn into ninth segment, directed caudad with truncate apex slightly upturned, a few minute setae present; seen from ventral aspect fig. 11C, base of clasper broad, at about three-quarters distance to the apex mesal margin tapers suddenly to an acute apex; dorsal hook of clasper extends caudad to this point, the pair contingent on meson. Dorsad, to the claspers arises a pair of heavily sclerotized processes, triangular from lateral view and gradually directed ventrad, slightly convergent from ventral view. Cercus, fig. 11, large, considerably expanded distally, quite heavily setose; laterally it covers all of genital processes except portion of clasper, no indication of mesal surface being concave. Apparently arising from the side of the tenth tergite, discernible from the lateral view, fig. 11, there is a pair of broad spine-like points directed dorso-caudad, and near its base a long slender seta. Aedeagus, fig. 11A, with neck constricted, spiral process encircles tube one and one-half times; from lateral view a distinct constriction present at point where spiral process arises; apex deeply incised, lateral processes convergent, mesal projection triangular, a large internal tube extending from its base to constricted portion; apical portion slightly enlarged distally.

Holotype, male.—Little Laramie River, Albany County, Wyoming, August 11, 1947 (R. E. Pfadt).

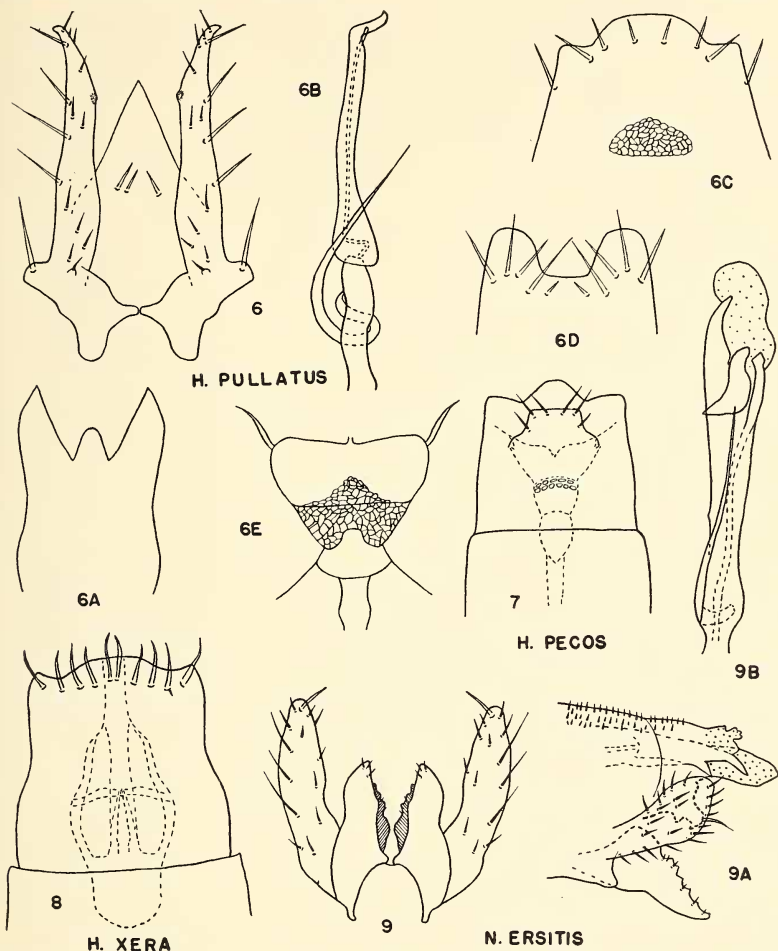
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**Notes on Six Aphis Species.**—*Aphis artemisicola* Wms. was very abundant on *Artemisia tridentata* at Huntington, Oregon, June 18, 1939. *Aphis forbesi* Weed was abundant in one patch of strawberries at Mill Creek, Utah, June 28, 1925; also taken on strawberry plants at Farmington, August 4, 1925, and abundant in greenhouse at Logan, Utah, March 26, 1942. *Aphis illinoisensis* Shimer was taken on grape tendrils at Bloomfield, Mo., May 19, 1922 (A. C. Burrill), and Mercersburg, Pa., June 12, 1931 (J. O. Pepper). *Aphis marutae* Oest. on *Cineraria*, Pullman, Washington, November 17, 1941 (L. K. Jones). *Aphis nasturtii* Kalt. was moderately abundant on watercress, *Roripa nasturtium*, at Locomotive Springs, Utah, April 10, 1930. *Aphis tulipae* (Boyer) was damagingly abundant on carrots in storage at Logan, January 1942, and Salt Lake City, April 3, 1942.—GEORGE F. KNOWLTON, Logan, Utah.



EXPLANATION OF PLATES IV, V AND VI.

- FIG. 1. *Leucotrichia pictipes*, claspers, ventral aspect.  
 FIG. 2. *Ochrotrichia potomus*, tenth tergite, dorsal aspect; 2A, female genitalia, eighth sternite.  
 FIG. 3. *Ochrotrichia oregona*, female genitalia, seventh and eighth sternite.  
 FIG. 4. *Hydroptila callia*, aedeagus, ventral aspect; 4A, lateral



aspect; 4B, tenth tergite, dorsal aspect; 4C, projection of seventh sternite.

FIG. 5. *Hydroptila wyomia*; aedeagus; 5A, lateral aspect.

FIG. 6. *Hydroptila pullatus*, ventral aspect; 6A, tenth tergite, dorsal aspect; 6B aedeagus, dorsal aspect; 6C, female, eighth sternite; 6D, female, eighth tergite; 6E, female, bursa copulatrix.

FIG. 7. *Hydroptila pecos*, female, eighth sternite.

FIG. 8. *Hydroptila xera*, female, eighth sternite.

FIG. 9. *Neotrichia ersitis*, ventral aspect; 9A, lateral aspect; 9B, aedeagus, dorsal aspect; 9C, female, bursa copulatrix.

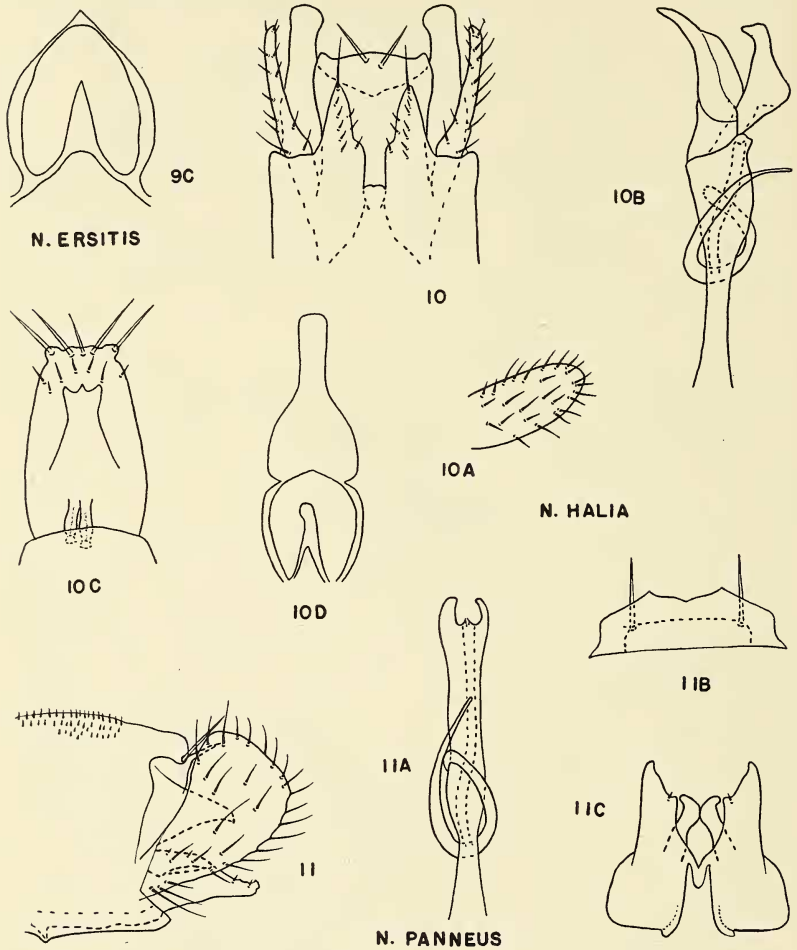


FIG. 10. *Neotrichia halia*, ventral aspect; 10A, cercus; 10B, aedeagus; 10C, female, eighth sternite; 10D, female, bursa copulatrix.

FIG. 11. *Neotrichia panneus*, lateral aspect; 11A, aedeagus; 11B, tenth tergite, dorsal aspect; 11C, ventral aspect.